FURUNO®

Integrated navigation package

RADAR/PLOTTER/SOUNDER

Models FRS-1000A/1000B/1000C



The future today with FURUNO's electronics technology.

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Catalogue No. L-156c

Announcing the World's First Four-in-One, Integrated Navigation Package.

The FRS-1000 series offers on clear color LCD:

- High definition X-Band Radar picture
- Accurate GPS/DGPS positioning
- Video Plotting with or without radar overlay
- 600 W/1 kW dual frequency Echo Sounder

FRS-1000A: With 4 kW, 36 nm radar
FRS-1000B: With 4 kW, 48 nm radar
FRS-1000C: With 6 kW, 64 nm radar

Softkeys:
Used to select menu options and enter numeric data.



MODE keys:
Turn radar, plotter and echo sounder on and off.

Infrared sensor
for remote controller

Emergency man-over-board key

MENU keys:
To utilize radar, plotter and echo sounder control menus



Remote Controller
(Standard supply)

Photo shows typical Radar/Plotter/Echo Sounder display.



3.5 ft radar antenna for the 48 nm **FRS-1000B**



Compact high-sensitivity GPS antenna



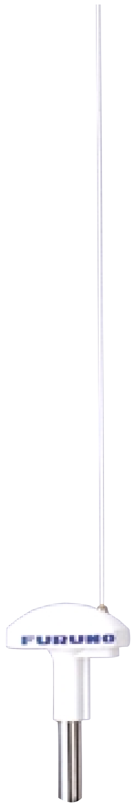
4 ft radar antenna for the 64 nm **FRS-1000C**



DGPS antenna (H-field)



2 ft radome antenna for the 36 nm **FRS-1000A**



DGPS antenna (E-field)
(Whip antenna optional)

- **All-in-One complete navigation system comprising:**
  - **- Radar**
  - **- GPS Receiver (DGPS optional)**
  - **- Video Plotter**
  - **- Echo Sounder**
- **Vividly clear pictures on the 10.4" TFT color LCD**
- **Works with the latest FURUNO MiniCharts or NAVIONICS Nav-Charts™ (PCMCIA type also acceptable)**
- **Radar picture overlay on a Furuno digital chart**
- **Head-up*, Course-up*, North-up and True Motion* modes for both radar and video plotter (* with FURUNO chart only)**
- **Automatic radar plotting option ARP-10 available to enhance the radar plotting function**
- **50/200 kHz echo sounder transducer, 600 W or 1 kW output power**
- **Optional built-in DGPS beacon receiver**
- **Optional 48 rpm radar antenna for high-speed boats (FRS-1000B/1000C only)**
- **Simple operation with an easy-to-understand menu structure plus Omni-pad and softkeys**
- **Space-saving, waterproof display suitable for protected and open bridge installation**
- **Up to two full function remote displays can be added as options**

Innovative Integration of Radar, GPS/Plotter and Echo Sounder with no-compromise. Highly advanced performance and easy operation

Full-featured, All-in-One Navigation Package

A revolutionary new all-in-one navigation package is now available from FURUNO. The world's first Radar/Plotter/Sounder Models FRS-1000A/1000B/1000C provide an ultimate solution to needs of a wide range of boaters.

This intelligent system permits you to present a radar display, GPS chart plotter and dual-frequency echo sounder pictures independently or in combination on a highly visible 10.4-inch TFT color LCD screen.

The individual system elements are ingeniously integrated without sacrificing the ease of operation. The straightforward menu structure combined with the OMNI-pad and softkeys ensures remarkably simple operation of the radar, GPS plotter and echo sounder.

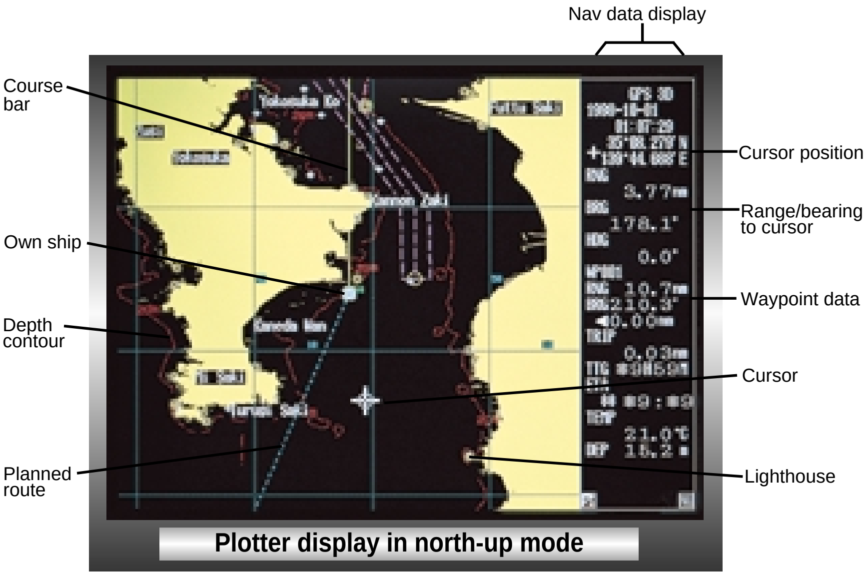
One or two remote displays can be optionally added. The main display unit and the individual remote displays can be operated independently of each other. Thus, the remote display on the upper deck may be set to echo sounder mode while the main display in the navigation bridge is used as the radar/GPS plotter, for example.

Optional supplies include the Auto Plotter ARP-10, DGPS beacon receiver kit with GPS/DGPS antenna, speed/temperature sensors, as well as FURUNO or NAVIONICS chart cards.

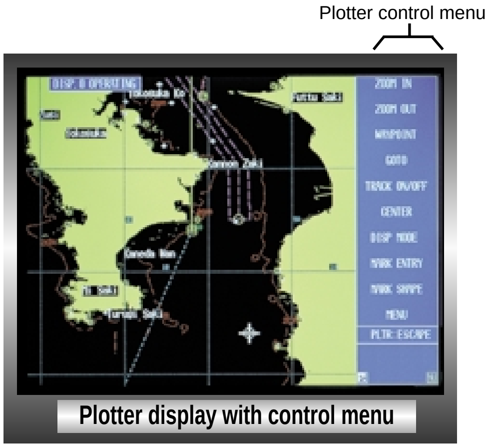
GPS Receiver/Plotter

The GPS receiver allows high accuracy position fixes. There is the choice of four presentation modes: North-up, Head-up, Course-up and True Motion.

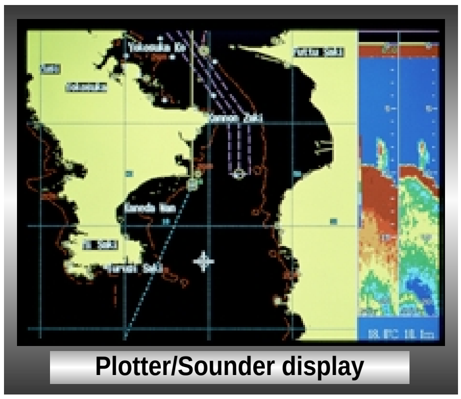
Chart data loaded from a FURUNO or NAVIONICS chart card (optional) presents coastlines with place names, depth contours, buoys, lighthouses and other navigational marks.



Plotter display in north-up mode



Plotter display with control menu



Plotter/Sounder display

The plotter control menu is called up by pressing the [PLTR] Menu/Esc key. This menu permits you to zoom in and out the plotter display, select display modes, enter waypoints, and so forth by combined use of the softkeys and Omni-pad.

Marks can be entered in different shapes, line types and colors to record your own secret points.

When you have specified a destination or the next waypoint, you may set a cross-track-error (XTE) alarm zone. This will make it easier to keep your vessel on the correct course.

The plotter display can be either overlaid with the radar image or combined with the echo sounder picture.

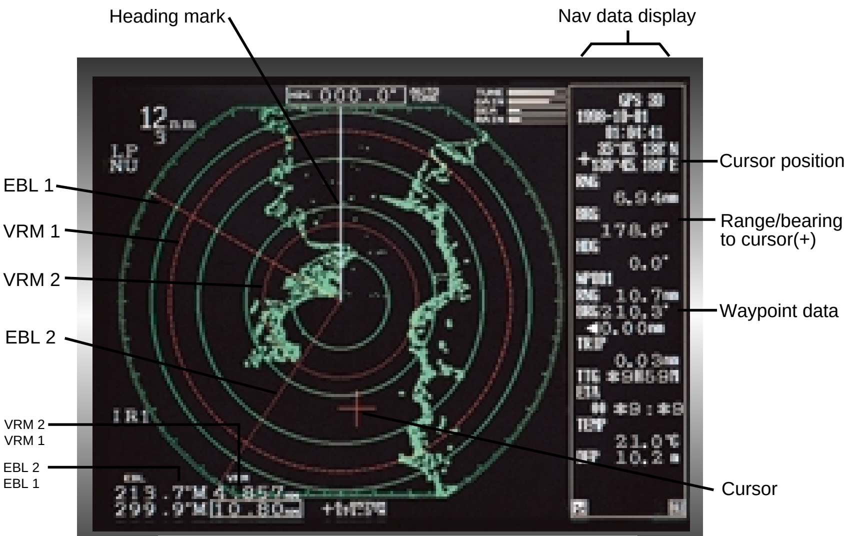
Radar

Four presentation modes are available: Head-up, Course-up, North-up and True Motion modes. In the True Motion mode, own ship and targets move according to their actual speed and heading while fixed targets including land echoes remain stationary. The user can easily understand the overall situation.

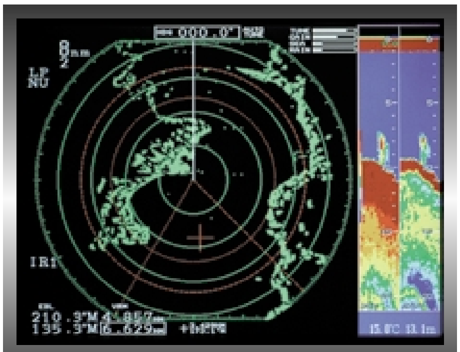
Standard features include two VRMs and two EBLs, off-centering to cursor position, echo trails, echo stretch and guard zone alarm.



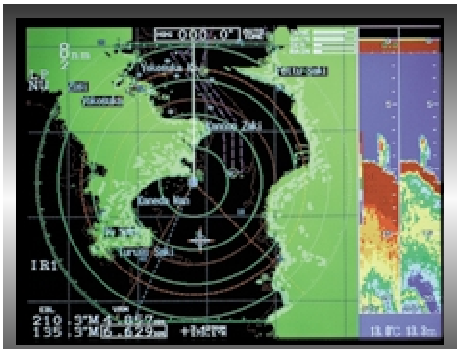
Radar display with control menu



Radar display in north-up mode



Radar/Sounder display



Radar/Plotter/Sounder display

The radar control menu is displayed by pressing the [RDR] Menu/Esc key. This menu permits you to switch the radar between transmit and standby conditions, select range scales, adjust gain/clutter suppression, and control EBLs/VRMs by using the softkeys and Omni-pad.

The guard zone alarm permits you to set a fan- or ring-shaped guard zone at a desired position with a choice of inward or outward target alerting.

A 48 rpm antenna is optionally available for the FRS-1000B or FRS-1000C to ensure uninterrupted picture updating for high-speed vessels.

Auto Plotter ARP-10 (option)



Heading data in AD-10 format required

The Auto Plotter ARP-10 option is added to the processor unit. It permits automatic or manual acquisition of up to 10 targets, tracks them at specified plot intervals, presents alphanumeric target data, and triggers a collision alarm for targets violating preset CPA/TCPA limits.

Target acquisition :	Automatic or manual acquisition of up to 10 targets in 0.2-16 nm
Tracking range :	0.1-16 nm
Vector mode :	True or relative vector
Vector length :	30 sec, 1, 2, 3, 4, 5, 6 or 12 min.
Target plot interval :	15 or 30 sec, 1, 2, 3 or 6 min.
Audio-visual alarm :	Produced against lost targets and targets on collision course
Target data display :	Range, bearing, course, speed and CPA/TCPA of a chosen target

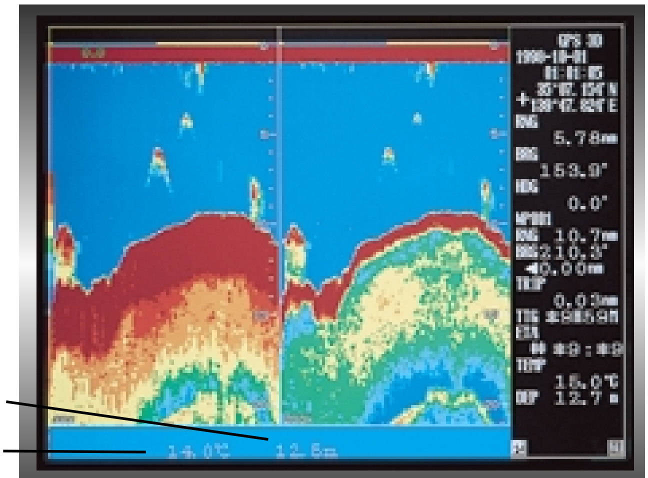
ARP-10 can not be used with 48 rpm antenna speed option

Echo Sounder

The high-performance 50/200 kHz echo sounder meets the need of recreational and professional fishermen.

It presents echoes in Normal (single or dual frequency), Bottom zoom, Bottom lock or Marker zoom display mode.

The automatic bottom-tracking function, which can be activated in the Normal display mode, tracks the seabed of varying depths by automatically phasing the sounding range and setting optimum receiver gain. This relieves you of the need for frequent adjustment when you are busy maneuvering the ship or fishing.



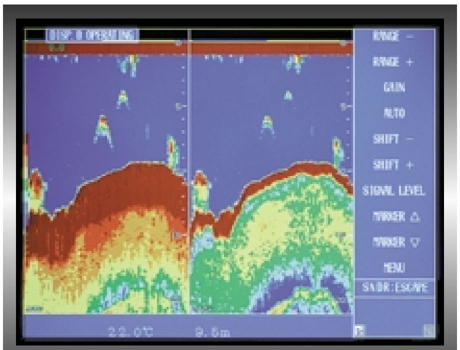
Sounder display in dual-frequency mode

The dual-frequency sounding shown above facilitates discrimination of bottom features and detection of individual fish or fish schools.

To call up the sounder control menu, just press the [SNDR] Menu/Esc key. You can then select a desired sounding range, adjust the receiver gain, phase the sounding range, move the variable depth marker, and so forth on this menu by simply using the softkeys and Omni-pad.

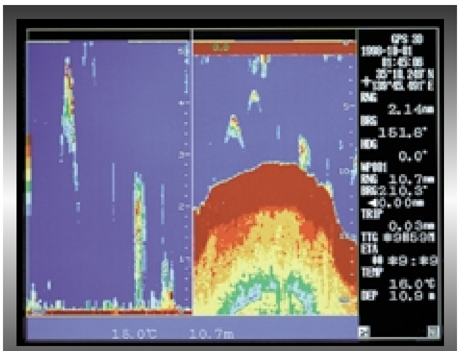
Alarms can be set to alert you to dangerous water depths and fish echoes. A water temperature alarm is also available if an appropriate sensor is connected to the system.

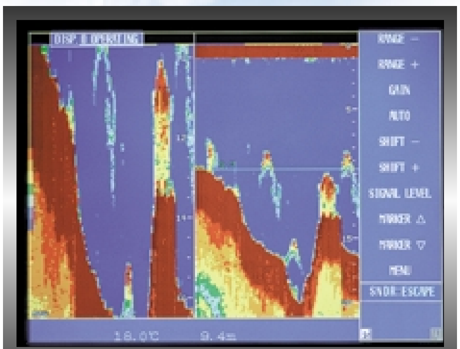
If you press the [SNDR] Mode key to present the echo sounder picture when the radar or plotter picture is already displayed, the echo sounder picture will be displayed at the right of the screen as shown on the preceding pages.



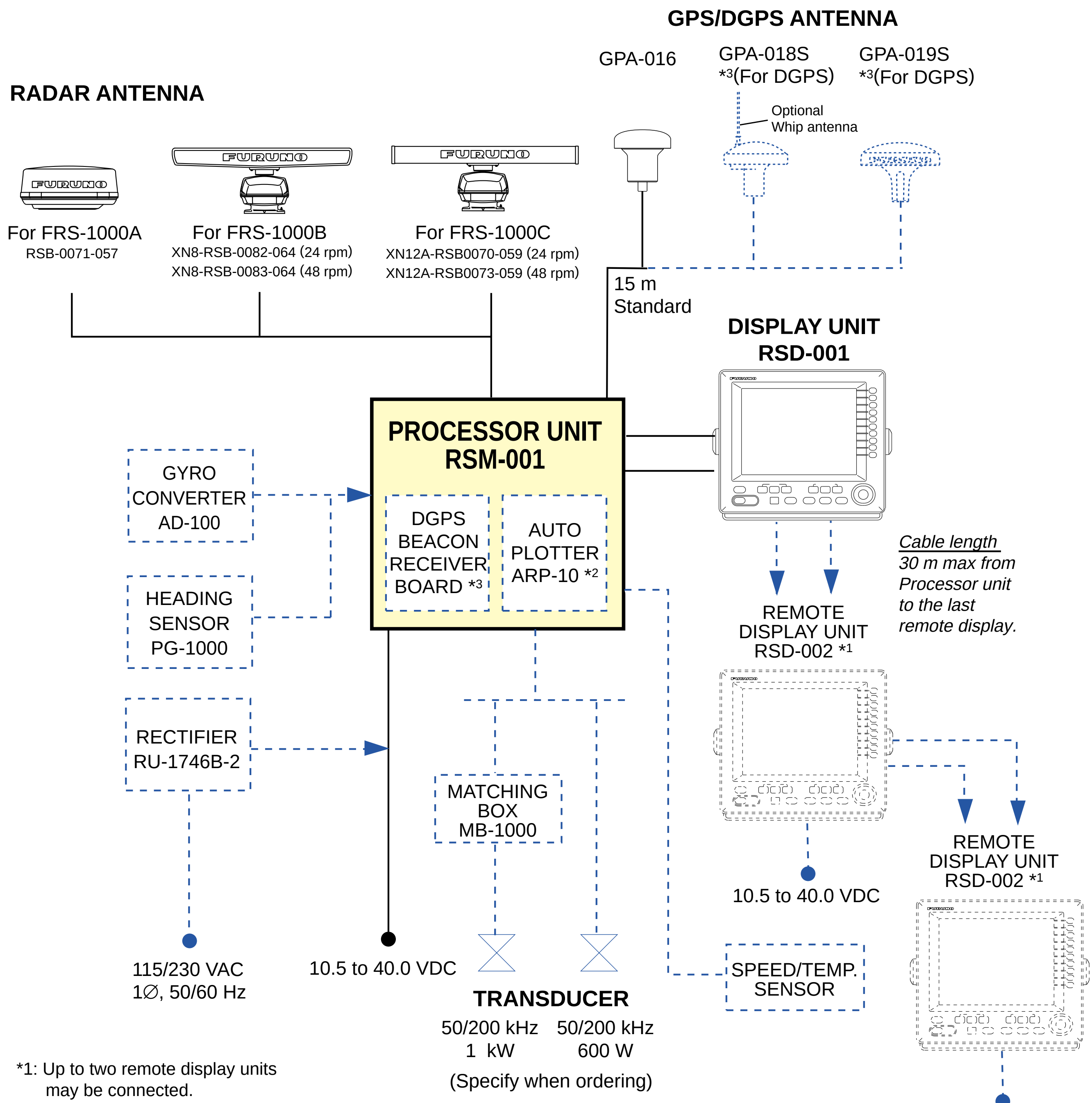
Sounder display with control menu




Bottom-lock expansion


Marker zoom

SYSTEM CONFIGURATION



*1: Up to two remote display units may be connected.

*2: 48 rpm antenna cannot be used and heading data in AD-10 or NMEA0183 format required

*3: DGPS requires built-in beacon receiver board

- - - - Optional



SPECIFICATIONS OF FRS-1000A/1000B/1000C

GENERAL

Display Unit 10.4-inch color LCD, 640 (H) x 480 (V) dots
Display Modes (1) Radar (2) Plotter (3) Echo sounder
(4) Radar/Plotter(5) Radar/Echo sounder
(6) Plotter/Echo sounder
(7) Radar/Plotter/Echo sounder
POWER SUPPLY 10.5 to 40.0 VDC, 100 W max

RADAR

1. **Antenna Type Output Power/Max Range**
   FRS-1000A: 60 cm radome (24 rpm)/4 kW/36 nm
   FRS-1000B: 3.5 ft open (24 rpm/48 rpm*)/4 kW/48 nm
   FRS-1000C: 4 ft open (24 rpm/48 rpm*)/6 kW/64 nm
   *Specify when ordering
2. **Presentation Modes**
   Head-up, Course-up*, North-up*, True motion**
   *Heading data required **Heading and speed data required
3. **Principal Functions**
   Auto tuning/anti-clutter, Echo Trails, Echo Stretch, two EBLs/VRMs, Picture Zoom (2x), Guard Zone Alarm

GPS PLOTTER

1. **Receiver Type** Eight discrete channels, C/A code, all-in-view
2. **Accuracy** 10 m, 95% of the time, HDOP≤4
   (less than 5 m with optional DGPS, 95% of the time)
3. **Map Scale** 0.15 to 2560 nm
4. **Capacity Plotter**
   2800 points for ship's track, 3800 marks, 200 waypoints (incl. starting point and externally entered waypoint), 20 planned routes (Max 30 waypoints/route)
5. **Presentation Modes**
   Head-up*, Course-up*, North-up, True motion* *With FURUNO chart only
6. **External Memory**
   Card slot for optional FURUNO and NAVIONICS chart ROM cards and RAM cards for storage of track points and marks
7. **Other Functions** MOB, Arrival/anchor watch, XTE alarm

ECHO SOUNDER

1. **Operating Frequency** Dual-frequency 50 and 200 kHz
2. **Output Power** 600 W or 1 kW rms
   (Optional matching box required for 1 kW output)
3. **Display Modes** Normal, Bottom zoom, Bottom lock, Marker zoom display
4. **Display Colors** 8 colors
5. **Basic Ranges** 8 basic ranges customized to max 1200 m (4000 ft, 650 fa)
6. **Range Phasing** Up to 2400 m (8000 ft, 1300 fa)
7. **Principal Functions**
   Automatic bottom tracking, Variable picture advance, Variable depth marker, Alarms for preset water depth, fish echoes, ship speed* and water temperature* (Appropriate sensors required.)

EQUIPMENT LIST

Standard

1. Display unit RSD-001 1 unit
2. Processor unit RSM-001 1 unit
3. Radar antenna (Specify when ordering) 1 unit
   FRS-1000A (60 cm radome/24 rpm/4 kW/36 nm)
   FRS-1000B (3.5 ft open/24 or 48 rpm/4 kW/48 nm)
   FRS-1000C (4 ft open/24/ or 48 rpm/6 kW/64 nm)
   Antenna cable: selectable from 10/15/20/30 m
4. Remote Controller RMC-010 1 unit
5. GPS GPA-016 antenna with 15 m cable 1 unit
6. Video/Data cables 5 m each 1 unit
7. Installation materials and spare parts 1 set

Optional

1. Internal DGPS beacon receiver kit
2. Remote display unit (2 units max)
3. Extension cables for Video/Data
   (specify cable length from 5/10/15/20/30 m)
4. Auto plotter ARP-10 (24 rpm antenna only)
5. Chart ROM card
   (FURUNO PCMCIA/MiniChart or NAVIONICS PCMCIA/Nav-Chart™)
6. RAM card (256, 512 kB or 1 MB)
7. Speed/temperature sensor ST-01MSB
8. Temperature sensor T-02MTB, T-02MSB, T-03MSB
9. Transducer matching box MB-1000
10. Gyro converter AD-100
11. 30 m extension cable for GPS antenna
12. 10 m extension cable for E/S transducer
13. GPS antenna base
    13-QA330 (Pipe mount), 13-QA310 (Offset bracket),
    13-RC5160 (Handrail mount)
14. NMEA cable 10 m FM-C6SPF001-100 (10 m)
15. Rectifier RU-1746B-2
16. Rectifier PR-62 for remote display unit RSD-002
17. DGPS antenna for GPA-018S or GPA-019S

E/S Transducers (specify when ordering)

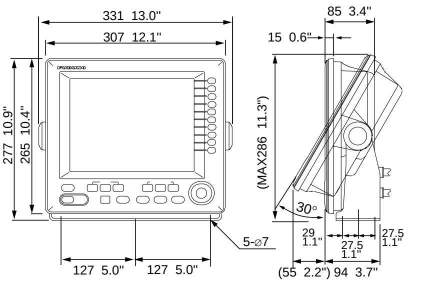
600W

50/200 kHz: 520-5PSD (plastic, thru-hull), 520-5MSD (bronze, thru-hull),
520-5PWD (plastic, transom),
520ST-PWD (plastic, transom with speed/temp sensor),
524ST-MSD (bronze, thru-hull with speed/temp sensor)

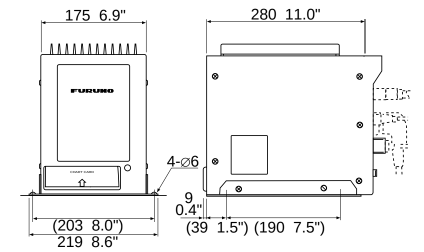
1 kW (Optional matching box required)

50/200 kHz: 50/200-1T
50 kHz: 50B-6, 50B-6G
200 kHz: 200B-5, 200B-5S

Display Unit 4.1 kg 9.0 lb

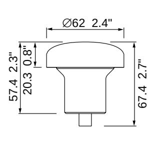


Processor Unit 6 kg 13.2 lb

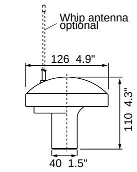


Antenna Unit

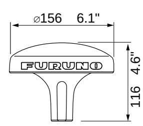
● GPS antenna GPA-016
0.1 kg 0.2 lb



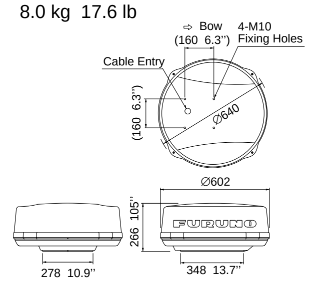
● DGPS antenna GPA-018S
0.3 kg 0.7 lb



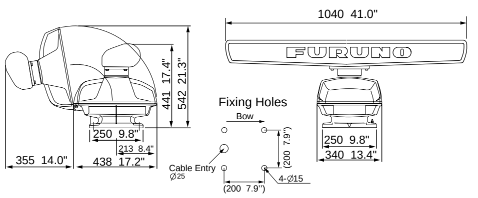
● DGPS antenna GPA-019S
1.0 kg 2.2 lb



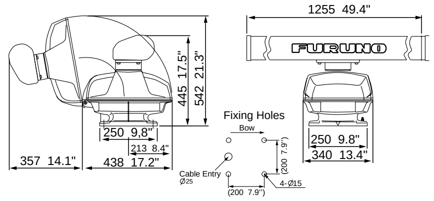
● Radar antenna for FRS-1000A
8.0 kg 17.6 lb



● Radar antenna for FRS-1000B
22 kg 44.1 lb



● Radar antenna for FRS-1000C
23 kg 50.7 lb



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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